Navajo Nation –Cottonwood Wash Watershed – Surface Water Quality Assessment Report (Integrated 305(b) Report and 303(d) Listing)



Pueblo Colorado Wash on March 25, 2004

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1.0 Background and Purpose

The objective of the United States Clean Water Act (USCWA) is to "restore and maintain the chemical, physical, and biological integrity of the Nation's Waters" (USGPO, 1988). In order to meet this objective, and exert its sovereign authority to protect its water resources, the Navajo Nation codified the Navajo Nation Clean Water Act (NNCWA 1999) in July 1999. The importance of water to the Navajo Nation is clearly demonstrated by the adoption of the NNCWA, with the Navajo Nation being only one of a few tribes or states to adopt a clean water act. The NNCWA provides the legislative authority to allow the Navajo Nation to fulfill the USCWA requirements.

In order to *restore* and *maintain* the chemical, physical, and biological integrity of the Nation's Water, states and federally recognized tribes adopt water quality standards which protect the uses of the Nation's water bodies. Water quality standards are narrative and numeric criteria used as benchmarks to determine if a designated use for a water body is being attained. NNCWA Section 103(a) (2) (A) provides for "the establishment of water quality standards to protect fish and wildlife and the domestic, cultural, agricultural and recreational uses of the waters of the Navajo Nation." This is consistent with the "fishable and swimmable goal" set forth in USCWA Sections 101(a) (2) and 303(c) (2). NNCWA Sections 201(b) and (c) requires that designated uses be established for public water supplies, the protection and propagation of fish and wildlife, recreational purposes, agricultural (including livestock watering), industrial, cultural, and other uses, and to establish criteria to protect the designated uses.

The Navajo Nation first codified the 1999 Navajo Nation Water Quality Standards (1999 NNWQS) in July 1999 (NNEPA 1999). On January 20, 2006 the US Environmental Protection Agency (USEPA) approved the Navajo Nation's application to administer the Water Quality Standards and Certification Programs under the federal Clean Water Act's Sections 303 and 401. On March 26, 2009, the USEPA approved the 2007 Navajo Nation Surface Water Quality Standards (2007 NNSWQS) (NNEPA 2008). The Navajo Nation Surface Water Quality Standards 2015 (NNSWQS 2015) is the revision to the 2007 NNSWQS. The 2015 NNSWQS were approved by the Navajo Nation Council Resources and Development Committee on May 23, 2017.

The Navajo Nation Environmental Protection Agency's National Pollutant Discharge Elimination System / Water Quality Program (NNEPA WQP) is responsible for implementing the requirements of the USCWA and the NNCWA within the Navajo Nation.

This report fulfills the federal Clean Water Act (CWA) Section 305(b) reporting requirements, CWA 303(d) listing requirements, EPA's CWA § 106 Tribal Guidance, Chapter 8 and Appendix A, assessment reporting requirements, and FY 2018-2019 National Water Program Guidance Measures WQ-06a. It also fulfills assessment reporting requirements in the "Navajo Nation Environmental Protection Agency Water Quality/Navajo Nation Pollutant Discharge Elimination System Program, Federal Clean Water Act Performance Partnership Grant" Work Plan.

The purpose of this report is to assess the Cottonwood Wash Watershed surface water quality data obtained by the NNEPA WQP by:

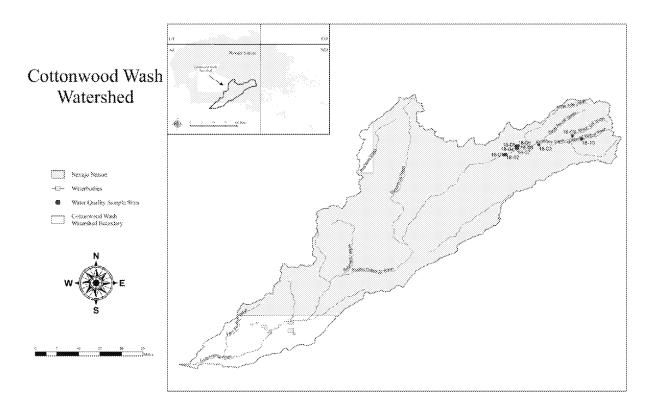
- 1. Presenting the surface water quality data;
- 2. Comparing the surface water quality data to the latest version of the NNSWQS to see if standards are being met; and
- 3. Determine if uses designated for surface waters are being supported using the methods described in the February 20, 2008 NNEPA document entitled: "Guidance for Assessing the Quality of Navajo Nation Surface Waters to Determine Impairment" (Integrated 305(b) Reporting and 303(d) Listing) (NNEPA Impairment Guidance).

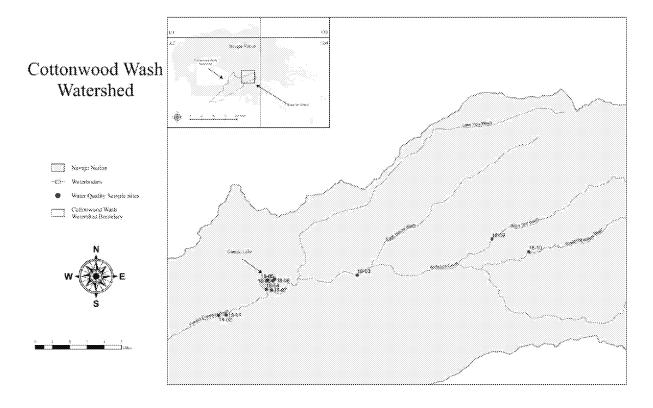
The Navajo Nation Cottonwood Wash Watershed Surface Water Quality Assessment Report is intended to be a living document, which can be updated to include the latest surface water quality data. The NNEPA WQP welcomes all comments that will assist in revising this report in the future.

2.0 Cottonwood Wash Watershed

The Cottonwood Wash Watershed (Figure 2.0) is located on approximately 1400 square miles within the Navajo Nation. The United States Geological Survey (USGS) 8-digit Hydrologic Unit Code (HUC) for the Cottonwood Wash Watershed is 115020011 (USGS 1987). The NNEPA WQP watershed code for the Cottonwood Wash Watershed is 18. Detailed geographic locations of the watershed sampling sites may be found in Section 4.0. An atlas of water bodies with known lengths and areas assessed by the NNEPA WQP within this watershed are listed in Table 2.0. There are 126.47 miles and 274.41 acres of sampled surface waters in this watershed.

Figure 2.0 – Cottonwood Wash Watershed (1400 square miles)





<u>Table 2.0 – Atlas of Assessed Surface Water Bodies with Known Lengths/Areas</u> (from Navajo Nation Department of Water Resources - March 31, 2009 and staff

calculations)

Surface Water Body Name Within The Navajo Nation	Length (miles) or Area (acres)
Pueblo Colorado Wash	87.74 miles
Kinlichee Creek	17.13 miles
Ganado Lake	274.41 acres
Scattered Willow Wash	10.00 miles
Black Soil Wash	11.60 miles

3.0 Cottonwood Wash Watershed - Surface Water Quality Data Collection Activities

Monitoring and water quality sampling of the Cottonwood Wash Watershed was conducted using professional experience and in accordance with the NNEPA WQP June 1, 2012 "Quality Assurance Plan for Surface Water Data Collection" or previous quality assurance plans. Measurements of physical/chemical characteristics and stream discharge were made. Samples were obtained and submitted to an analytical laboratory for analyses. Quality Assurance and Quality Control samples were also obtained.

4.0 Cottonwood Wash Watershed - Surface Water Quality Data Assessment

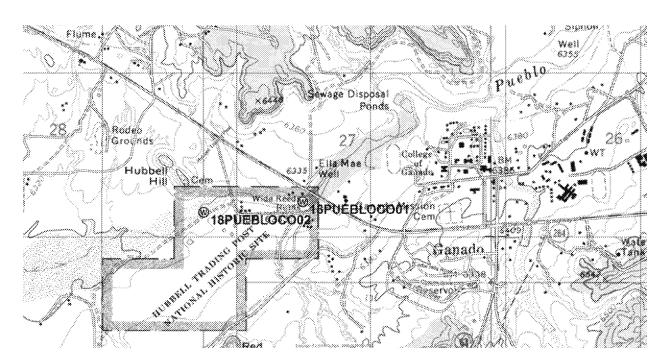
The following tables provide detailed information on the Cottonwood Wash Watershed sample sites. When available a site photograph is provided. The sample site name used for sampling is provided along with the alias used to locate the sample site on the watershed map in Section 2.0. The total number of years sampled is provided along with years sampled during the assessment period. The assessment period is the consecutive time period where a minimum number of samples must be obtained in order to determine designated use support. In most instances it is a three year consecutive period where a minimum of five samples must be obtained. (Please refer to the NNEPA Impairment Guidance). Water quality data at each site was compared to the numeric standards in the NNSWQS 2015. Uses designated for each water body in the NNSWQS 2015 are listed in each table. These uses may include Domestic Water Supply (Dom), Primary Human Contact (PrHC), Secondary Human Contact (ScHC), Fish Consumption (FC), Aquatic & Wildlife (Acute and Chronic) (A&W (A) and A&W (C)), Agricultural Water Supply (AgWS), and Livestock Watering (LW). Exceedances of the numeric standard are

provided for any analyte for both the individual analyte and for the analytes corresponding to each designated use. Also provided are the percentages of exceedances from the number of samples obtained. The letter "n" refers to the number of samples obtained.

Analytes are listed in each table only if they have been found to have exceeded the numeric standard at any surface water sample site within the watershed. If, for example, aluminum is listed as an analyte at "Site X" but did not exceed the numeric standard at "Site X", it is listed because it did exceed the numeric standard at another location within the watershed, "Site A". The purpose of this is to understand the distribution of the analyte within the watershed.

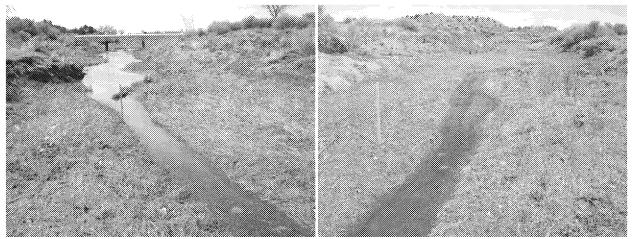
The category of designated use support from the NNEPA Impairment Guidance may be found at the end of each table. Designated use support categories are determined, in part, by comparing the analytical result at each sample site to the NNSWQS 2015. The NNEPA WQP may also choose to list surface waters as impaired if it pursues primacy granted by USEPA for federal Clean Water Act Section 303(d).

To obtain the complete set of surface water quality analytical data from this watershed used in these tables please call 505-368-1037.



Map 4.1 – Pueblo Colorado Wash Sample Sites

Photographs 4.1 – Pueblo Colorado Wash Sample Sites



March 25, 2004

March 25, 2004

<u>Table 4.1.1 – Pueblo Colorado Wash Site 18PUEBLOCO01 – Water Quality Data Assessment Table</u>

Site 18PUEBLOCO01

Site	Alias	Location	
18PUEBLOCO01	18-01	Pueblo Colorado Wash @ upper Hubbell Trading Post	

To	tal	Assessme	ent period
Year(s) sampled # of Sample Events		Year(s) sampled	# of Sample Events
1998-1999	4	1998-1999	4

^{*}Note that not all analytes were necessarily sampled each sample event.

	All sar	mples	Assessment period		
	Total Total		Total	Total	
	number of	analytes	number of	analytes	
Designated Use	exceedances	exceeded	exceedances	exceeded	
FC	0	0	0	0	
PrHC	0	0	0	0	
ScHC	0	0	0	0	
A&WHbt (A)	0	0	0	0	
A&WHbt (C)	0	0	0	0	
AgWS	0	0	0	0	
LW	0	0	0	0	

- 4.1.1 Pueblo Colorado Wash Site 18PUEBLOCO01- Designated Use Support and Impairment Determination
 - Was the minimum number of samples to determine designated use support obtained during the assessment period? No
 - Category of Designated Use Support: Category 3 There is insufficient data to determine if any designated use is supported.

<u>Table 4.1.2 – Pueblo Colorado Wash Site 18PUEBLOCO02 – Water Quality Data Assessment Table</u>

Site 18PUEBLOCO02

Site	Alias	Location
18PUEBLOCO02	18-02	Pueblo Colorado Wash @ lower Hubbell Trading Post

To	tal	Assessme	ent period
Year(s) sampled # of Sample Events		Year(s) sampled	# of Sample Events
1998-2008	11	1999-2001	5

^{*}Note that not all analytes were necessarily sampled each sample event.

	All sai	mples	Assessment period		
	Total Total		Total	Total	
	number of	analytes	number of	analytes	
Designated Use	exceedances	exceeded	exceedances	exceeded	
FC	0	0	0	0	
PrHC	0	0	0	0	
ScHC	0	0	0	0	
A&WHbt (A)	0	0	0	0	
A&WHbt (C)	0	0	0	0	
AgWS	1	1	1	1	
LW	1	1	1	1	

	Agricultural Water Supply					
	All samples			Assessmer	nt peri	iod
Analyte	Exceedances	n	Percent	Exceedances	n	Percent
Radium-226/228 (T)	1	3	33.3%	1	1	100.0%

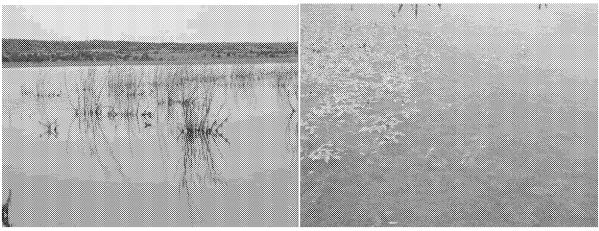
	Livestock Watering						
	All samples			Assessmer	nt peri	iod	
Analyte	Exceedances	n	Percent	Exceedances	n	Percent	
Radium-226/228 (T)	1	3	33.3%	1	1	100.0%	

- 4.1.2 Pueblo Colorado Wash Site 18PUEBLOCO02 Designated Use Support and Impairment Determination
 - Was the minimum number of samples to determine designated use support obtained during the assessment period? Yes.
 - Category of Designated Use Support: Category 1 All designated uses are supported

Map 4.2 – Ganado Lake Sample Sites



Photographs 4.2 - Ganado Lake Sample Sites -



August 5, 2004 August 5, 2004

<u>Table 4.2 – All Ganado Lake Sites – Water Quality Data Assessment Tables</u>

Site 18GANADOLA04

Site	Alias	Location	
18GANADOLA04	18-04	Ganado Lake near west side of dam	

То	tal	Assessment period		
Year(s) sampled # of Sample Events		Year(s) sampled* # of Sample Ever		
2002-2009	5	2008-2009	2	

^{*}Note that not all analytes were necessarily sampled each sample event.

	All sai	mples	Assessment period		
	Total number	Total	Total number	Total	
	of	analytes	of	analytes	
Designated Use	exceedances	exceeded	exceedances	exceeded	
FC	0	0	0	0	
PrHC	0	0	0	0	
ScHC	0	0	0	0	
A&WHbt (A)	1	1	0	0	
A&WHbt (C)	2	2	0	0	
AgWS	0	0	0	0	
LW	0	0	0	0	

	Aquatic and Wildlife Habitat (Acute)					
	All samples			Assessment period		
Analyte	Exceedances	n	Percent	Exceedances	n	Percent
Copper (D)	1	5	20.0%	0	2	0.0%

	Aquatic and Wildlife Habitat (Chronic)					
	All samples			Assessmen	ıt peri	iod
Analyte	Exceedances	n	Percent	Exceedances	n	Percent
Copper (D)	1	5	20.0%	0	2	0.0%
Selenium (T)	1	5	20.0%	0	2	0.0%

Site 18GANADOLA05

Site	Alias	Location
18GANADOLA05	18-05	Ganado Lake near middle

To	tal	Assessment period		
Year(s) sampled # of Sample Events		Year(s) sampled*	# of Sample Events*	
2002-2009 5		2008-2009	2	

*Note that not all	analytes were	necessarily sami	oled each	sample event.
INDECTION OF OUR	CHICKLY COURSOLC	, rivevoluting Juning	PICH CHAIL	Junitary Cacine

	All sai	mples	Assessment period		
	Total number	Total	Total number	Total	
	of	analytes	of	analytes	
Designated Use	exceedances	exceeded	exceedances	exceeded	
FC	0	0	0	0	
PrHC	0	0	0	0	
ScHC	0	0	0	0	
A&WHbt (A)	0	0	0	0	
A&WHbt (C)	1	1	0	0	
AgWS	0	0	0	0	
LW	0	0	0	0	

	Aquatic and Wildlife Habitat (Chronic)					
	All samples			Assessmer	ıt peri	od
Analyte	Exceedances	n	Percent	Exceedances	n	Percent
Selenium (T)	1	5	20.0%	0	2	0.0%

Site 18GANADOLA06

Site	Alias	Location	
18GANADOLA06	18-06	Ganado Lake east shore	

То	tal	Assessment period		
Year(s) sampled # of Sample Events		Year(s) sampled*	# of Sample Events*	
2003-2005 3		2003-2005	3	

^{*}Note that not all analytes were necessarily sampled each sample event.

	All samples		Assessment period	
	Total number	Total	Total number	Total
	of	analytes	of	analytes
Designated Use	exceedances	exceeded	exceedances	exceeded
FC	0	0	0	0
PrHC	0	0	0	0
ScHC	0	0	0	0
A&WHbt (A)	0	0	0	0
A&WHbt (C)	0	0	0	0
AgWS	0	0	0	0
LW	0	0	0	0

Site 18GANADOLA07

Site	Alias	Location
18GANADOLA07	18-07	Ganado Lake from east side of dam

То	tal	Assessme	ent period
Year(s) sampled # of Sample Events		Year(s) sampled*	# of Sample Events*
2002-2005 4		2003-2005	3

^{*}Note that not all analytes were necessarily sampled each sample event.

	All samples		Assessment period	
	Total number	Total	Total number	Total
	of	analytes	of	analytes
Designated Use	exceedances	exceeded	exceedances	exceeded
FC	0	0	0	0
PrHC	0	0	0	0
ScHC	0	0	0	0
A&WHbt (A)	0	0	0	0
A&WHbt (C)	0	0	0	0
AgWS	0	0	0	0
LW	0	0	0	0

Site 18GANADOLA08

Site	Alias	Location
18GANADOLA08	18-08	Ganado Lake east side

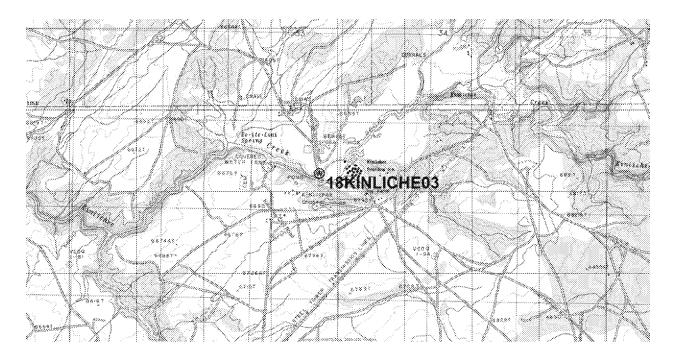
То	tal	Assessment period		
Year(s) sampled # of Sample Events		Year(s) sampled*	# of Sample Events*	
2004 1		2004	1	

^{*}Note that not all analytes were necessarily sampled each sample event.

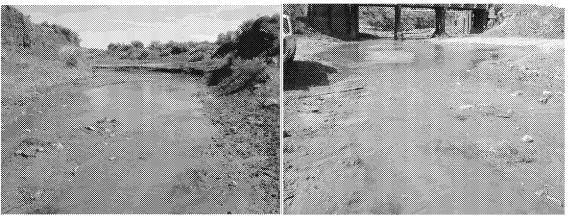
	All samples		Assessment period	
	Total number	Total	Total number	Total
	of	analytes	of	analytes
Designated Use	exceedances	exceeded	exceedances	exceeded
FC	0	0	0	0
PrHC	0	0	0	0
ScHC	0	0	0	0
A&WHbt (A)	0	0	0	0
A&WHbt (C)	0	0	0	0
AgWS	0	0	0	О
LW	0	0	0	0

- 4.2 All Ganado Lake Sampling Sites Designated Use Support and Impairment Determination
 - Was the minimum number of samples to determine designated use support obtained during the assessment period? No
 - Category of Designated Use Support: Category 3 There is insufficient data to determine if any designated use is supported.

Map 4.3 - Kinlichee Creek Sample Site

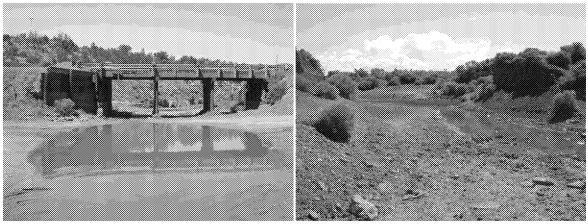


Photographs 4.3 – Kinlichee Creek Sample Site

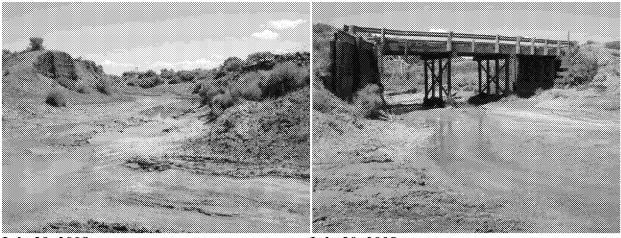


March 25, 2004 March 25, 2004

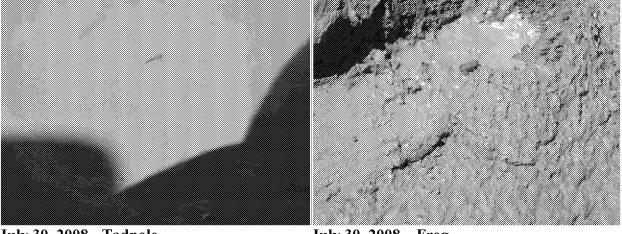
Photographs 4.3 – Kinlichee Creek Sample Site (continued)



June 27, 2006 June 27, 2006



July 30, 2008 July 30, 2008



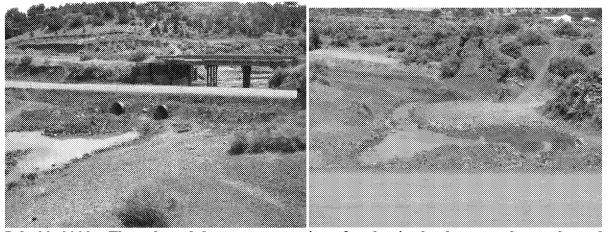
July 30, 2008 - Tadpole July 30, 2008 - Frog

Photographs 4.3 – Kinlichee Creek Sample Site (continued)



July 22, 2009

July 22, 2009



July 22, 2009 - Flow altered due to construction of undersized culverts underneath road crossing.

<u>Table 4.3 – Kinlichee Creek Sample Site – Water Quality Data Assessment Table</u>

Site 18KINLICHE03

Site	Alias	Location	
18KINLICHE03	18-03	Kinlichee Creek	

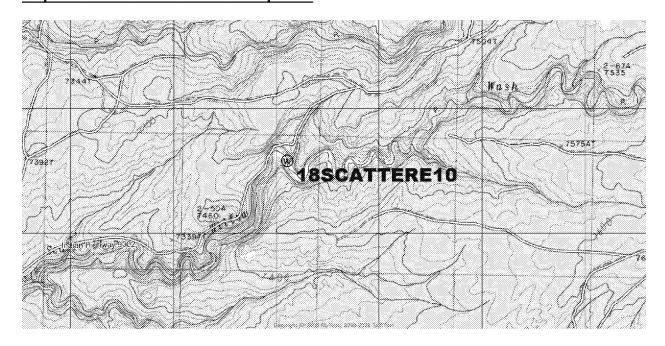
То	tal	Assessme	nt period
Year(s) sampled # of Sample Events		Year(s) sampled	# of Sample Events
1999-2019 14		2019	3

^{*}Note that not all analytes were necessarily sampled each sample event.

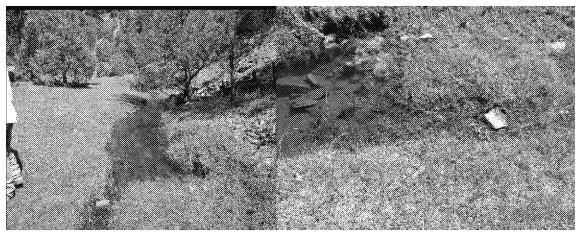
	All sai	mples	Assessment period	
	Total	Total	Total	Total
	number of	analytes	number of	analytes
Designated Use	exceedances	exceeded	exceedances	exceeded
FC	0	0	0	0
PrHC	0	0	0	0
ScHC	0	0	0	0
A&WHbt (A)	0	0	0	0
A&WHbt (C)	0	0	0	0
AgWS	0	0	0	0

- 4.3 Kinlichee Creek Sample Site Designated Use Support and Impairment Determination
 - Was the minimum number of samples to determine designated use support obtained during the assessment period? No
 - Category of Designated Use Support: Category 3 There is insufficient data to determine if any designated use is supported.

Map 4.4 - Scattered Willow Wash Sample Site



Photographs 4.4 – Scattered Willow Wash Sample Site



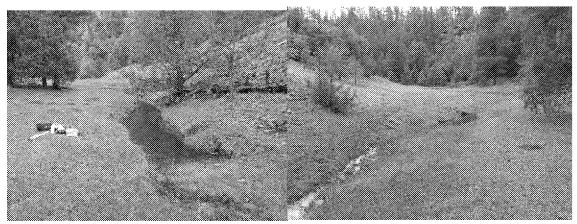
September 3, 2019

September 3, 2019



September 12, 2019

September 12, 2019



September 23, 2019

September 23, 2019

<u>Table 4.4 – Scattered Willow Wash – Water Quality Data Assessment Table</u>

Site 18SCATTERE10

Site	Alias	Location	
18SCATTERE10	18-10	Scattered Willow Wash	

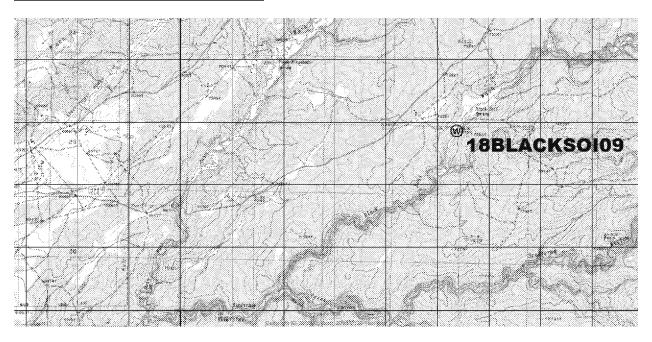
То	tal	Assessment period	
Year(s) sampled # of Sample Events		Year(s) sampled*	# of Sample Events*
2019 3		2019	3

^{*}Note that not all analytes were necessarily sampled each sample event.

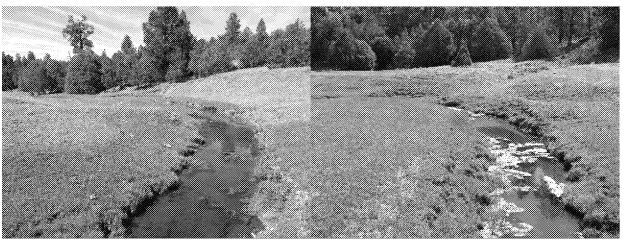
	All samples		Assessment period	
	Total number	Total	Total number	Total
	of	analytes	of	analytes
Designated Use	exceedances	exceeded	exceedances	exceeded
FC	0	0	0	0
PrHC	0	0	0	0
ScHC	0	0	0	0
A&WHbt (A)	0	0	0	0
A&WHbt (C)	0	0	0	0
AgWS	0	0	0	0
LW	0	0	0	0

- 4.4 Scattered Willow Wash Sample Site Designated Use Support and Impairment Determination
 - Was the minimum number of samples to determine designated use support obtained during the assessment period? No
 - Category of Designated Use Support: Category 3 There is insufficient data to determine if any designated use is supported.
 - The minimum number of samples to determine designated use support is expected to be obtained in FY 2020.

Map 4.5 - Black Soil Wash Sample Site



<u>Photographs 4.5 – Black Soil Wash Sample Site</u>



August 27, 2019

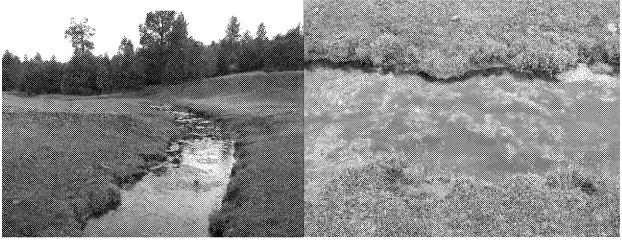
August 27, 2019

Photographs 4.5 – Black Soil Wash Sample Site (continued)



September 11, 2019

September 11, 2019



September 23, 2019

September 23, 2019

<u>Table 4.5 – Black Soil Wash Sample Site – Water Quality Data Assessment Table</u>

Site 18BLACKSOI09

Site	Alias	Location
18BLACKSOI09	18-09	Black Soil Wash

Total		Assessment period		
Year(s) sampled	# of Sample Events	Year(s) sampled*	# of Sample Events*	
2019	3	2019	3	

^{*}Note that not all analytes were necessarily sampled each sample event.

	All sa	mples	Assessment period	
	Total number	Total	Total number	Total
	of	analytes	of	analytes
Designated Use	exceedances	exceeded	exceedances	exceeded
FC	0	0	0	0
PrHC	0	0	0	0
ScHC	0	0	0	0
A&WHbt (A)	0	0	0	0
A&WHbt (C)	0	0	0	0
AgWS	0	0	0	0
LW	0	0	0	0

Table 4.5 – Black Soil Wash Sample Site – Water Quality Data Assessment Table (continued)

- 4.5 Black Soil Wash Sample Site Designated Use Support and Impairment Determination
 - Was the minimum number of samples to determine designated use support obtained during the assessment period? No
 - Category of Designated Use Support: Category 3 There is insufficient data to determine if any designated use is supported.
 - The minimum number of samples to determine designated use support is expected to be obtained in FY 2020.

5.0 References

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